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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/561,495  
Filing Date: June 16, 2006  
Appellant(s): GAUKROGER, DAVID ALEXANDER

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Patrick F. Clunk  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 14 January 2010 appealing from the Office action mailed 14 April 2009.

**(1) Real Party in Interest**

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The following is a list of claims that are rejected and pending in the application:

Claims 1 - 7, 9 - 30 and 32 - 45

**(4) Status of Amendments After Final**

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

**(5) Summary of Claimed Subject Matter**

The examiner has no comment on the summary of claimed subject matter contained in the brief.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the

subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

**(7) Claims Appendix**

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

**(8) Evidence Relied Upon**

6,810,138 B1	Schanz	10-2004
4,578,810	MacFarlane et al.	03-1986

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 6, 9, 23 - 25, 29 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Schanz U.S. Patent No. 6,810,138.

- With regards to claims 1 and 24, Schanz teaches an inspection system and method for inspecting deposits printed on workpieces through a

printing screen, the system comprising: a camera unit movable relative to a printing screen, (**Schanz, Column 5 Lines 13 – 40 and Lines 49 - 67, Column 6 Lines 39 - 41 [Schanz states that “the optoelectronic apparatus 1 can be moved along the double-headed arrow 21 in FIG. 1... After this screen-printing process, the printing stencil 3 and the printed circuit board 2 are moved apart, with the result that the optoelectronic apparatus 1 can enter the intermediate space.” Schanz discloses a first optoelectronic device 6 and a second optoelectronic device 7. Schanz also discloses two image recording sensors 11 and 12.]** where comprising a body including a plurality of apertures, (**Schanz, Column 6 Lines 1 - 23 [Schanz states that “said image recording sensor can consequently generate in a pixel structure a corresponding image of the structure, in particular the coordinates, shape and size of the stencil openings, of the printing stencil 3.”]**) and a workpiece on which deposits are printed through the apertures of the printing screen; (**Schanz, Column 5 Lines 13 – 16 and Lines 57 - 65 [Schanz states that “...inspection of the underside 2 of a printing stencil 3, used in the screen-printing process, as well as the side 4 of the printed circuit board 5 onto which the solder paste is applied in the screen-printing process.”]**) and a control unit operable to control the camera unit such as to capture images of at least one pair of corresponding regions of the printing screen and the workpiece, (**Schanz,**

**Column 6 Lines 1 - 48 [Schanz states that "said image recording sensor can consequently generate in a pixel structure a corresponding image of the structure, in particular the coordinates, shape and size of the stencil openings, of the printing stencil 3." and "The image recording sensor 11 provides information-in pixel form-on the success of the application of solder paste to the printed circuit board 5."]]** and process the images to determine, in turn, for each of a plurality of points defining the image of the printing screen, whether the point is of aperture, **(Schanz, Column 6 Lines 1 - 24 [Schanz states "said image recording sensor can consequently generate in a pixel structure a corresponding image of the structure, in particular the coordinates, shape and size of the stencil openings, of the printing stencil 3."])** and, where the point is of aperture, determine whether the corresponding point of the corresponding image of the workpiece, as defined by a corresponding plurality of points, is of deposit, **(Schanz, Column 5 Lines 58 - 67 and Column 6 Lines 25 - 48 ["the reference pattern of the printing stencil 3 is compared with the actual pattern, that is the solder paste application on the printed circuit board 5, whereby any defects can be identified."])** thereby enabling a determination of a print characteristic of deposits printed on the workpiece from a relationship of the points determined to be of deposit to the points determined to be of aperture. **(Schanz, Column 5 Lines 58 - 67 and**

**Column 6 Lines 36 - 56 ["In this way, an inspection is possible with regard to the adequacy of the solder paste application."])**

- With regards to claims 2 and 25, Schanz teaches the system and method of claims 1 and 24, wherein the camera unit is operable simultaneously to capture images of the printing screen and the workpiece. **(Schanz, Column 6 Lines 1 – 48 and Column 7 Lines 24 - 28 [Schanz teaches a camera unit consisting of two image sensors, Elements 11 and 12, which are operable (i.e. capable of) to capture images simultaneously])**
- With regards to claims 6 and 29, Schanz teaches the system and method of claims 1 and 24, wherein the control unit is configured to process the captured images subsequent to acquisition. **(Schanz, Column 6 Lines 36 – 48)**
- With regards to claims 9 and 32, Schanz teaches the system and method of claims 1 and 24, wherein the images of the printing screen and the workpiece are pixilated images, with the points defining each of the images being pixels of the pixilated images. **(Schanz, Column 6 Lines 13 - 24 and Lines 36 - 38 [Schanz states that "said image recording sensor can consequently generate in a pixel structure a**

corresponding image of the structure, in particular the coordinates, shape and size of the stencil openings, of the printing stencil 3." and "The image recording sensor 11 provides information-in pixel form-on the success of the application of solder paste to the printed circuit board 5."])

- With regards to claim 23, Schanz teaches a screen printing machine incorporating the inspection system of claim 1. (Schanz, Fig. 1 Abstract, Column 5 Lines 12 – 20)

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.



Claims 3, 5, 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schanz U.S. Patent No. 6,810,138.

- With regards to claims 3 and 26, Schanz teaches the system and method of claims 1 and 24. Schanz teaches the use of image recording sensors to generate a pixel structure corresponding to an image. Schanz do not expressly teach wherein the camera unit is a full-area camera unit for capturing full-area images of the printing screen and the workpiece. However, the Examiner takes Official Notice of the fact that it is well known in the art to utilize full-area images to inspect workpieces. This modification would have been prompted in order to quickly accept an entire workpiece or reject an entire workpiece exhibiting defects. The Examiner notes that the common knowledge or well-known in the art statement is taken to be admitted prior art because Applicant failed to traverse the Examiner's assertion of official notice.
- With regards to claims 5 and 28, Schanz teaches the system and method of claims 1 and 24. Schanz teaches the processing of images of the aperture and workpiece. Schanz does not expressly teach wherein the control unit is configured simultaneously to process the images of the printing screen and the workpiece during image capture by the camera unit. However, the Examiner takes Official Notice of the fact that

simultaneous processing of the two corresponding images for comparison is notoriously well-known in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Schanz to simultaneously process the images in order to decrease the amount of information being held in static memory locations.

The Examiner notes that the common knowledge or well-known in the art statement is taken to be admitted prior art because Applicant failed to traverse the Examiner's assertion of official notice.

Claims 4, 7, 10 - 22, 27, 30 and 33 - 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schanz U.S. Patent No. 6,810,138 as applied to claims 1 and 24 above, and further in view of MacFarlane et al. U.S. Patent No. 4,578,810.

- With regards to claims 4 and 27, Schanz teaches the system and method of claims 1 and 24. Schanz is silent to the fact wherein the camera unit is a line-scan camera unit for capturing line-scan images of the printing screen and the workpiece. MacFarlane et al. teach wherein the camera unit is a line-scan camera unit for capturing line-scan images of the printing screen and the workpiece. **(MacFarlane et al., Figs. 1, 2, & 3, Column 6 Lines 19 - 41)** It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Schanz with the teachings of MacFarlane et al. This modification would

have been prompted in order to allow for a more consistent approach in analyzing workpieces that are moving with respect to the image capture device.

- With regards to claims 7 and 30, Schanz teaches the system and method of claims 1 and 24. Schanz fails to teach wherein the images of the printing screen and the workpiece are defined by respective ones of screen and workpiece signals having intensities in dependence upon the imaged features, with the points defining each of the images being time-sliced components of the respective screen and workpiece signals. MacFarlane et al. teach wherein the images of the printing screen and the workpiece are defined by respective ones of screen and workpiece signals having intensities in dependence upon the imaged features, **(MacFarlane et al., Column 4 Lines 46 - 64)** with the points defining each of the images being time-sliced components of the respective screen and workpiece signals. **(MacFarlane et al., Figs. 1 – 3, Column 5 Lines 3 - 39)** It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Schanz in view of MacFarlane et al. This modification would have been prompted in order to allow for sequential imaging and inspection of workpieces as well as eliminate uncertainties in determining whether a point is of aperture or workpiece.

- With regards to claims 10 and 33, Schanz teaches the system and method of claims 9 and 32. Schanz fails to teach wherein the relationship of the points determined to be of deposit to the points determined to be of aperture is determined from a number count of the number of pixels determined to be of deposit relative to the number of pixels determined to be of aperture. MacFarlane et al. teach wherein the relationship of the points determined to be of deposit to the points determined to be of aperture is determined from a number count of the number of pixels determined to be of deposit relative to the number of pixels determined to be of aperture. **(MacFarlane et al., Fig. 3, Column 4 Lines 46 – 64, Column 13 Line 15 – Column 14 Line 13)** It would have been obvious to one of ordinary skill in the art to modify the teachings of Schanz with the teachings of MacFarlane et al. This modification would have been prompted in order to inspect workpieces wherein the images have been thresholded, i.e. set to a '1' or a '0'.
  
- With regards to claims 11 and 34, Schanz teaches the system and method of claims 9 and 32. Schanz fails to teach wherein the control unit is configured to acquire a plurality of pairs of corresponding images of the printing screen and the workpiece in accordance with an inspection schedule defining a plurality of inspection sites at which images are in use acquired. MacFarlane et al. teach wherein the control unit is configured to

acquire a plurality of pairs of corresponding images of the printing screen and the workpiece in accordance with an inspection schedule defining a plurality of inspection sites at which images are in use acquired.

**(MacFarlane et al., Column 5 Line 33 – Column 6 Line 41)** It would have been obvious to one of ordinary skill in the art to modify the teachings of Schanz with the teachings of MacFarlane et al. This modification would have been prompted in order to inspect large areas without a loss in processing speed.

- With regards to claims 12 and 35, Schanz in view of MacFarlane et al. teach the system and method of claims 11 and 34. Schanz fail to teach wherein the inspection sites of the inspection schedule are determined in a set-up routine. MacFarlane et al. teach wherein the inspection sites of the inspection schedule are determined in a set-up routine. **(MacFarlane et al., Column 5 Line 33 – Column 6 Line 41)** It would have been obvious to one of ordinary skill in the art to modify the combined teachings of Schanz in view of MacFarlane et al. with further teachings of MacFarlane et al. This modification would have been prompted in order to allow for a more consistent, registered, approach in analyzing workpieces that are moving with respect to the image capture device.

- With regards to claims 13 and 36, Schanz in view of MacFarlane et al. teach the system and method of claims 12 and 35. Schanz fails to teach wherein an offset in the corresponding pair of images of the printing screen and the workpiece as acquired by the camera unit at each inspection site is predetermined, such that the pixel in an image of the workpiece corresponding to a pixel in the corresponding image of the printing screen is determined in accordance with the offset. MacFarlane et al. teach wherein an offset in the corresponding pair of images of the printing screen and the workpiece as acquired by the camera unit at each inspection site is predetermined, such that the pixel in an image of the workpiece corresponding to a pixel in the corresponding image of the printing screen is determined in accordance with the offset. **(MacFarlane et al., Column 5 Line 33 – Column 6 Line 41)**
  
- With regards to claims 14 and 37, Schanz teaches the system and method of claims 1 and 24. Schanz is silent to the fact that the print characteristic comprises a representation of a percentage of a determined deposit coverage as compared to an expected deposit coverage. MacFarlane et al. teach wherein the print characteristic comprises a representation of a percentage of a determined deposit coverage as compared to an expected deposit coverage. **(MacFarlane et al., Column 13 Line 16 – Column 14 Line 13)** It would have been obvious to one of ordinary skill in

the art to modify the teachings of Schanz with the teachings of MacFarlane et al. This modification would have been prompted in order to determine if an area of the workpiece contains enough deposit thereon to pass inspection.

- With regards to claims 15 and 38, Schanz in view of MacFarlane et al. teach the system and method of claims 14 and 37. Schanz fails to teach wherein the print characteristic is provided as a representation for all deposits. MacFarlane et al. teach wherein the print characteristic is provided as a representation for all deposits. **(MacFarlane et al., Column 13 Line 16 – Column 14 Line 13)**
- With regards to claims 16 and 39, Schanz in view of MacFarlane et al. teach the system and method of claims 15 and 38. Schanz fails to teach wherein the representation is of a worst case deposit. MacFarlane et al. teach wherein the representation is of a worst case deposit. **(MacFarlane et al., Column 13 Line 16 – Column 14 Line 13, specifically Column 13 Lines 26 - 34 [see section 10 subsection xvii. below])**
- With regards to claims 17 and 40, Schanz in view of MacFarlane et al. teach the system and method of claims 11 and 34. Schanz fails to teach wherein the print characteristic comprises a representation of a

percentage of a determined deposit coverage as compared to an expected deposit coverage, and the print characteristic is provided as a plurality of representations for the inspection sites. MacFarlane et al. teach wherein the print characteristic comprises a representation of a percentage of a determined deposit coverage as compared to an expected deposit coverage, **(MacFarlane et al., Column 13 Line 16 – Column 14 Line 13)** and the print characteristic is provided as a plurality of representations for the inspection sites. **(MacFarlane et al., Column 13 Line 16 – Column 14 Line 13)**

- With regards to claims 18 and 41, Schanz in view of MacFarlane et al. teach the system and method of claims 17 and 40. Schanz fails to teach wherein the representation for each inspection site is of a worst case deposit in the respective inspection site. MacFarlane et al. teach wherein the representation is of a worst case deposit in the respective inspection site. **(MacFarlane et al., Column 13 Line 16 – Column 14 Line 13, specifically Column 13 Lines 26 – 34 [see section 10 subsection xvii. below])**
- With regards to claims 19 and 42, Schanz in view of MacFarlane et al. teach the system and method of claims 17 and 40. Schanz fails to teach wherein the representation for each inspection site comprises a plurality of



representations corresponding to at least ones or groups of ones of the deposits in the respective inspection site. MacFarlane et al. teach wherein the representation for each inspection site comprises a plurality of representations corresponding to at least ones or groups of ones of the deposits in the respective inspection site. **(MacFarlane et al., Column 12 Line 39 – Column 13 Line 14 [MacFarlane et al. describe a variety of different representations depending on the type and/or position of PWB being inspected])**

- With regards to claims 20 and 43, Schanz teaches the system and method of claims 1 and 24. Schanz fails to teach wherein the points determined to be of deposit are determined by reference to a reference threshold value of image intensity. MacFarlane et al. teach wherein the points determined to be of deposit are determined by reference to a reference threshold value of image intensity. **(MacFarlane et al., Column 4 Lines 46 – 64)** It would have been obvious to one of ordinary skill in the art to modify the teachings of Schanz with the teachings of MacFarlane et al. This modification would have been prompted in order to decrease the amount of computational power required to compare reference and instant images.

- With regards to claims 21 and 44, Schanz in view of MacFarlane et al. teach the system and method of claims 20 and 43. Schanz fails to teach wherein, for at least one of the apertures, the points determined to be of deposit are determined as having an image intensity one of above or below a reference threshold value of image intensity. MacFarlane et al. teach wherein, for at least one of the apertures, the points determined to be of deposit are determined as having an image intensity one of above or below a reference threshold value of image intensity. **(MacFarlane et al., Column4 Lines 46 – 64, Column 6 Line 44—Column 7 Line 39)**
  
- With regards to claims 22 and 45, Schanz in view of MacFarlane et al. teach the system and method of claims 20 and 43. Schanz fails to teach, wherein, for at least one of the apertures, the points determined to be of deposit are determined as having an image intensity within upper and lower bounding limits of a reference threshold value of image intensity. MacFarlane et al. teach wherein, for at least one of the apertures, the points determined to be of deposit are determined as having an image intensity within upper and lower bounding limits of a reference threshold value of image intensity. **(MacFarlane et al., Column4 Lines 46 – 64, Column 6 Line 44—Column 7 Line 39)**

**(10) Response to Argument**

i. Prior to responding to the Appellant's arguments the Examiner would like to briefly address the Appellant's summary of the present invention. On page 10 first paragraph of the brief filed 14 January 2010, the Appellant states "By referencing points in the image of the workpiece *only where* the corresponding points in the image of the printing screen are determined to be of aperture and *not for all points in the image* of the printing screen, the image processing is simplified." The Examiner asserts that **nowhere in the instant claims is there a limitation corresponding to** "referencing points in the image of the workpiece *only where the corresponding points in the image of the printing screen are determined to be of aperture and not for all points in the image of the printing screen...*".

ii. On page 11 of the brief filed 14 January 2010, with respect to claim 1, the Appellant alleges that Schanz "makes no disclosure or suggestion whatsoever of determining, in turn for each of a plurality of points defining the image of the printing stencil 3, whether the point is of aperture, and, where the point is of aperture, determining whether the corresponding point of the corresponding image of the circuit board 5, as defined by a corresponding plurality of points is of deposit, in the manner required by claim 1." The Appellant goes on to allege that "this determination for each point in turn, that is, on a point-by-point basis, as required by claim 1, is not disclosed or suggested by Schanz." First, the Examiner would like to point out that **nowhere in the instant claims is a "point-**

**by-point basis” claimed or defined** as alleged by the Appellant. Furthermore, the Examiner asserts that Schanz does in fact teach *the claimed limitation* which requires “process[ing] the images to determine, in turn, for each of the plurality of points defining the image of the printing screen, whether the point is of aperture, and, where the point is of aperture, determine whether the corresponding points of the corresponding image of the workpiece, as defined by a corresponding plurality of points, is of deposit...”, see Schanz column 6 lines 13 - 27 and lines 36 - 44. In the aforementioned sections Schanz states that “The image recording sensor 11 provides information - in pixel form - on the success of the application of solder paste to the printed circuit board 5.” and “...the reference pattern of the printing stencil 3 is compared with the actual pattern, that is the solder paste application on the printed circuit board 5, whereby any defects can be identified.”. The Examiner asserts that the comparison of Schanz between the information of the printing stencil and printed circuit board, in pixel form, implicitly determines whether a point is of aperture, and, where the point is of aperture, determines whether the corresponding point of the corresponding image of the workpiece (circuit board) is of deposit, this is taken to be because Schanz is able to detect any defects between the reference pattern of the stencil and the actual pattern of the solder paste application on the circuit board by a step of comparing.

iii. On page 12 first paragraph of the brief filed 14 January 2010, the Appellant argues, with respect to claim 1, that the reference pattern of Schanz “manifestly cannot be a pixilated image”. The Appellant alleges that reference

pattern of Schanz is previously recorded in a teach-in method from a plurality of test patterns prior to initial use of the printing stencil. The Examiner respectfully disagrees. The Examiner asserts that the Appellant is referencing various different portions of the disclosure of Schanz which do not necessarily go together, as can be seen from the Appellants referencing of columns and lines from the "description of the related art", "brief summary of the invention" and "detailed description of the invention" sections of Schanz. The Examiner asserts that Schanz does in fact teach that their reference pattern is a pixilated image, see Schanz column 6 lines 13 - 20. In the aforementioned sections Schanz states "said image recording sensor can consequently generate *in a pixel structure* a corresponding image of the structure, in particular the coordinates, shape and size of the stencil openings, of the printing stencil." The Examiner also asserts that the Appellant erred in their allegation that the reference pattern, the image of the printing stencil of Schanz is determined prior to initial use of the printing stencil. The Examiner asserts that Schanz teaches that their invention also relates to "an apparatus for generating test patterns *during the application* of solder paste to printed circuit boards...", see Schanz column 3 lines 30 - 34, and the Examiner also asserts that Schanz teaches that his inspection, and generating of reference and actual patterns, is done after the solder is applied, see Schanz column 5 lines 49 - 67. In the aforementioned section Schanz states:

"This takes place as soon as solder paste has been applied by means of the printing stencil 3 to the side 4 of the printed circuit board 5 in the

screen-printing process. After this screen-printing process, the printing stencil 3 and the printed circuit board 2 are moved apart, with the result that the optoelectronic apparatus 1 can enter the intermediate space. In this way, an inspection is possible with regard to the adequacy of the solder paste application. In this inspection, the underside 2 of the printing stencil 3 is inspected by means of the first optoelectronic device 6 and the side 4 of the printed circuit board 5 is inspected by means of the second optoelectronic device 7."

iv. On page 12 second paragraph of the brief filed 14 January 2010, with respect to claim 1, the Appellant continues to argue that the mode of operation of Schanz is manifest from the very fact that a reference pattern has first to be recorded for the printing stencil 3 in a teach-in method. The Appellant goes on to state that "if the mode of operation of Schanz were, as alleged by the Examiner, that of capturing corresponding images of the printing stencil 3 and the printed circuit board 5 and then effecting a point-by-point determination of the captured images in the manner as required by claim 1, there would be absolutely no need for a reference pattern." The Appellant finally alleges that the comparison of Schanz of an actual pattern and the reference pattern is "...manifestly not the determination as required by claim 1, that is, a determination, in turn, for each point of the plurality of points which define the image of the printing stencil 3, but of the patterns in toto, that is the reference and actual patterns." The Examiner respectfully disagrees with the Appellant's allegations of the teachings of Schanz

and with what is claimed in the instant claims. First, the Examiner asserts that **nowhere in the instant claims is it defined that "a determination, in turn, for each point of the plurality of points which define the image of the printing stencil..."** In addition, the Examiner asserts that **nowhere in the instant claims is it defined that there is a step of effecting a point-by-point determination.**

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "a determination, in turn, for each point of the plurality of points which define the image of the printing stencil..." and "effecting a point-by-point determination") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Furthermore, the Examiner asserts that reference pattern of Schanz is determined at the time of inspection and not prior to initial use of the stencil as alleged by the Appellant see subsection iii. above.

v. On page 13 second paragraph of the brief filed 14 January 2010, with respect to claim 1, the Appellant argues that Schanz does not disclose that a "comparison of the reference pattern and the actual pattern can be done on a point-by-point basis...". The Appellant states that "Accordingly, Schanz does not disclose processing the image to determining, in turn, for each of a plurality of points defining the image of the printing screen, whether the point is of aperture, and, where the point is of aperture, determine whether the corresponding point of

the corresponding image of image of the workpiece.” [as defined by a corresponding plurality of points, is of deposit]. The Examiner respectfully disagrees. First, the Examiner asserts that **nowhere in the instant claims is it defined that a “comparison of the reference pattern and the actual pattern can be done on a point-by-point basis...”**. Furthermore, the Examiner asserts that Schanz does in fact teach “determining, in turn, for each of a plurality of points defining the image of the printing screen, whether the point is of aperture, and, where the point is of aperture, determine whether the corresponding point of the corresponding image of image of the workpiece, as defined by a corresponding plurality of points, is of deposit”, see Schanz column 5 lines 58 - 67, column 6 lines 13 - 21 and column 6 lines 36 - 44. In the aforementioned sections Schanz states that “the reference pattern of the printing stencil 3 is compared with the actual pattern, that is the solder paste application on the printed circuit board 5, whereby any defects can be identified.” the Examiner asserts that very definition of comparing the two patterns, which are obtained from two image recording sensors 11 and 12 of Schanz, implicitly defines that the points of aperture are compared to (i.e. checked against) the points of deposit. This fact is also corroborated by the statement in column 5 lines 62 - 63 of Schanz, “In this way, an inspection is possible with regard to the adequacy of the solder paste application.”. Furthermore, the Examiner asserts that because both patterns are in fact pixilated images the step of comparing is in fact determining for a plurality of points (pixels) whether the point is of aperture and when it is of



aperture if the corresponding point in the corresponding image is of deposit, again the Examiner asserts that this is implicit from the definition of comparing, and the step of comparing the reference pattern of the printing stencil with the actual pattern of the printed circuit board and is further evidenced by the notion of inspection with regards to the adequacy of the solder paste application.

vi. On page 14 second paragraph of the brief filed 14 January 2010, with respect to claim 1, the Appellant argues that the claims of Schanz "provide further proof that Schanz does not disclose and did not intent to process the image to determine, in turn, for each of a plurality of points defining the image of the printing screen, whether the point is of aperture.". The Examiner asserts that again the Appellant is referencing various portions of Schanz's disclosure which do not necessarily go together. The Examiner asserts that the disclosure of Schanz *in its entirety* is being applied as art against the instant claim and asserts that more often than not prior art disclosures disclose multiple embodiments, variations and modifications which do not exclude any other teachings disclosed in the reference(s). The Examiner asserts that the sections cited by the Appellant were not and are not relied upon to teach claim 1 (or 24) and asserts that the teachings of the detailed description of the invention was and is relied upon. Furthermore, the Examiner asserts that the claims of Schanz do not obviate any other teachings, disclosure and/or suggestions made by Schanz.

vii. On page 14 third paragraph of the brief filed 14 January 2010, with respect to claim 1, the Appellant argues that claim 1 does disclose a point-by-

point determination. The Examiner disagrees. The Examiner asserts that **nowhere in claim 1 is a point-by-point determination** recited or defined.

Claim 1 recites:

"An inspection system for inspecting deposits printed on workpieces through a printing screen, the system comprising:  
a camera unit movable relative to a printing screen, where comprising a body including a plurality of apertures, and a workpiece on which deposits are printed through the apertures of the printed screen; and  
a control unit operable to control the camera unit such as to capture images of at least one pair of corresponding regions of the printing screen and the workpiece, and process the images to determine, in turn, for each of a plurality of points defining the image of the printing screen, whether the point is of aperture, and, where the point is of aperture, determine whether the corresponding point of the corresponding image of the workpiece, as defined by a corresponding plurality of points, is of deposit, thereby enabling a determination of a print characteristic of deposits printed on the workpiece from a relationship of the points determined to be of deposit to the points determined to be of aperture."

The Examiner, again, asserts that **nowhere in claim 1 is a point-by-point determination** recited or defined. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "a point-by-point determination")

are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

viii. On page 15 first paragraph of the brief filed 14 January 2010, with respect to claim 1, the Appellant argues that claim 1 is further distinguished from Schanz "in requiring that only where a point in the image of the printing screen is determined to be of aperture is a determination made as to whether the corresponding point in the corresponding image of the workpiece is of deposit." The Examiner respectfully and in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., only where a point in the image of the printing screen is determined to be of aperture is a determination made as to whether the corresponding point in the corresponding image of the workpiece is of deposit) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

ix. On page 15 second paragraph of the brief filed 14 January 2010, with respect to claim 1, the Appellant argues that Schanz does not disclose that "a determination is made as to whether a corresponding point in the corresponding image of the workpiece is of deposit only where a point in the image of the printing screen is determined to be of aperture." The Examiner

respectfully and in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a determination is made as to whether a corresponding point in the corresponding image of the workpiece is of deposit *only where* a point in the image of the printing screen is determined to be of aperture) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The Examiner also directs attention to subsection i. above.

x. On page 16 second paragraph of the brief filed 14 January 2010, with respect to claim 24, the Appellant argues that Schanz does not teach or suggest the subject matter of claim 24 for the same reasons discussed with respect to claim 1. The Examiner respectfully disagrees with the Appellant for the same reasons discussed above with respect to claim 1, see subsections i. - ix.

xi. On pages 16 - 17 of the brief filed 14 January 2010, with respect to claim 2, the Appellant argues that Schanz does not disclose that the image sensors simultaneously capture images of the printing screen and the workpiece. The Examiner asserts that claim 2 recites "wherein the camera unit is *operable* simultaneously to capture images of the printing screen and the workpiece.". The Examiner asserts that Schanz discloses two image recording sensors 11 and 12. The Examiner also asserts that the optoelectronic apparatus of Schanz is inserted between the printing stencil and the printed circuit board, after the

screen printing process, see Schanz column 5 lines 56 - 67. Finally the Examiner asserts that the two optoelectronic devices or two image recording sensors are *operable* simultaneously to capture images of the printing screen and the workpiece, see Schanz column 6 lines 1 - 48 and column 7 lines 24 - 28. In other words, the two image sensors of Schanz *can or are capable of operating* (operable) simultaneously.

xii. On page 17 second paragraph of the brief filed 14 January 2010, with respect to claim 25, the Appellant argues that Schanz does not teach or suggest the subject matter of claim 25 for the same reasons discussed with respect to claim 2. The Examiner respectfully disagrees with the Appellant for the same reasons discussed above with respect to claim 2, see subsection xi.

xiii. On pages 18 - 19 of the brief filed 14 January 2010, with respect to claim 3, the Appellant argues that "the skilled person would not be motivated to modify Schanz to include such a camera unit [a full-area camera]". The Appellant alleges that Schanz "takes test patterns of certain particularly susceptible regions and use the test patterns to form reference patterns." and that "Taking a full-area image of the stencil would prevent Schanz from forming its reference pattern from test patterns, and because Schanz uses the reference patterns to compare to the actual patterns of the circuit board, Schanz would not be able to compare images." The Examiner respectfully disagrees. The Examiner asserts that a 103(a) rejection was utilized along with Official Notice, which was not traversed, to teach that Schanz could be modified to contain a full-area camera unit. The

Examiner asserts that, again, the Appellant is deviating from the detailed description of the invention and misrepresenting what Schanz discloses. As discussed above the reference pattern of Schanz is determined after the screen-printing process, along with the actual pattern. The Examiner asserts that a full-area camera used in the description of Schanz would not make Schanz inoperable. The Examiner asserts that Schanz is silent to the type of camera (optoelectronic devices or image recording sensors) that are used. The Examiner asserts that a full-area camera would not affect the invention of Schanz. As discussed above, the Examiner asserts that Schanz teaches generating a pixilated image of the printing stencil, referred to as a reference pattern, and generating a pixilated image of the printed circuit board, referred to as an actual pattern, and compares the two. The Examiner asserts that a full-area camera would have no detrimental effect upon the invention of Schanz as it is only required that two pixilated images are taken and compared. Furthermore, this is evidenced by the fact that the instant application claims and disclosure disclose a separate embodiment wherein the camera unit is a line-scan camera unit, see claim 4 of the instant application, and a full-area camera unit, see claim 3 of the instant application.

xiv. On page 19 first paragraph of the brief filed 14 January 2010, with respect to claim 26, the Appellant argues that Schanz does not teach or suggest the subject matter of claim 26 for the same reasons discussed with respect to

claim 3. The Examiner respectfully disagrees with the Appellant for the same reasons discussed above with respect to claim 3, see subsection xiii.

xv. On pages 19 - 20 of the brief filed 14 January 2010, with respect to claim 5, the Appellant argues that "Schanz does not disclose simultaneously taking the images, and therefor, Schanz cannot simultaneously process the images of the printing screen and the workpiece during image capturing by the camera unit." The Appellant additionally argues that because Schanz "first has to obtain its reference image and expressly state that after the images are taken is it then possible to compare the images, there is not teaching in Schanz that would lead one to believe that Schanz could be modified to simultaneously capture and process the images. The Examiner asserts that Schanz was not solely relied upon to teach claim 5. The Examiner asserts that a 103(a) rejection was utilized along with Official Notice, which was not traversed, to teach that a control unit could be configured to simultaneously process the images of the printing screen and the workpiece during image capture by the camera unit. The Examiner asserts that because the images of the printing screen and the workpiece need not be outputted for the comparison to take place, i.e. no perceivable representation needs to be generated, that therefor Schanz could be modified to simultaneously process the images of the printing screen and the workpiece during image capture by the camera unit. Schanz column 6 lines 48 - 49 states "If a defect is discovered, automatic operation can be stopped and the defect can be visually displayed on a screen", from the aforementioned section of

Schanz it is clear that the images *can be* displayed on a screen *if a defect is discovered*, in other words Schanz does not require a visual output of the images for the comparison step.

xvi. On page 20 third paragraph of the brief filed 14 January 2010, with respect to claim 28, the Appellant argues that Schanz does not teach or suggest the subject matter of claim 28 for the same reasons discussed with respect to claim 5. The Examiner respectfully disagrees with the Appellant for the same reasons discussed above with respect to claim 5, see subsection xv.

xvii. On page 21 of the brief filed 14 January 2010, with respect to claim 16, the Appellant argues that nowhere column 13 lines 26 - 34 of MacFarlane et al. does it make reference "to a print characteristic provided as a representation of a worst case deposit". The Examiner respectfully disagrees. The Examiner asserts that MacFarlane et al. describe a print characteristic provided as a representation of a best case scenario. MacFarlane et al. disclose that "if all A pixels are on a conductor, thus representing an ON or ONE signal, then all B pixels must also be on a conductor or else there is a small area defect...". In other words, MacFarlane et al. describe that, for a binary image (black and white), if one image being compared to another image is represented by all 1's then the corresponding other image must also be all 1's or there is a defect. The Examiner asserts that this description of the best case scenario, i.e. a perfect match, implicitly gives a representation of a worst case, i.e. the opposite the finding. For example, if the best case is that image A is composed of all 1's and



image B is composed of all 1's, or the converse when image A is all 0's and image B is all 0's then the worst case (in this example) is inherently when none of the pixels of image A match any of the pixels of image B, e.g. image A is all 1's and image B is all 0's (a representation of the worst case).

xviii. On page 22 first paragraph of the brief filed 14 January 2010, with respect to claim 29, the Appellant argues that Schanz in view of MacFarlane et al. do not teach or suggest the subject matter of claim 29 for the same reasons discussed with respect to claim 16. The Examiner respectfully disagrees with the Appellant for the same reasons discussed above with respect to claim 16, see subsection xvii.

xix. On page 22 second and third paragraphs of the brief filed 14 January 2010, with respect to claim 18, the Appellant argues that Schanz in view of MacFarlane et al. do not teach or suggest the subject matter of claim 18 for the same reasons discussed with respect to claim 16. The Examiner respectfully disagrees with the Appellant for the same reasons discussed above with respect to claim 16, see subsection xvii.

xx. On page 22 fourth paragraph of the brief filed 14 January 2010, with respect to claim 41, the Appellant argues that Schanz in view of MacFarlane et al. do not teach or suggest the subject matter of claim 41 for the same reasons discussed with respect to claim 18. The Examiner respectfully disagrees with the Appellant for the same reasons discussed above with respect to claim 16, see subsection xvii.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Eric Rush

/E. R./

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